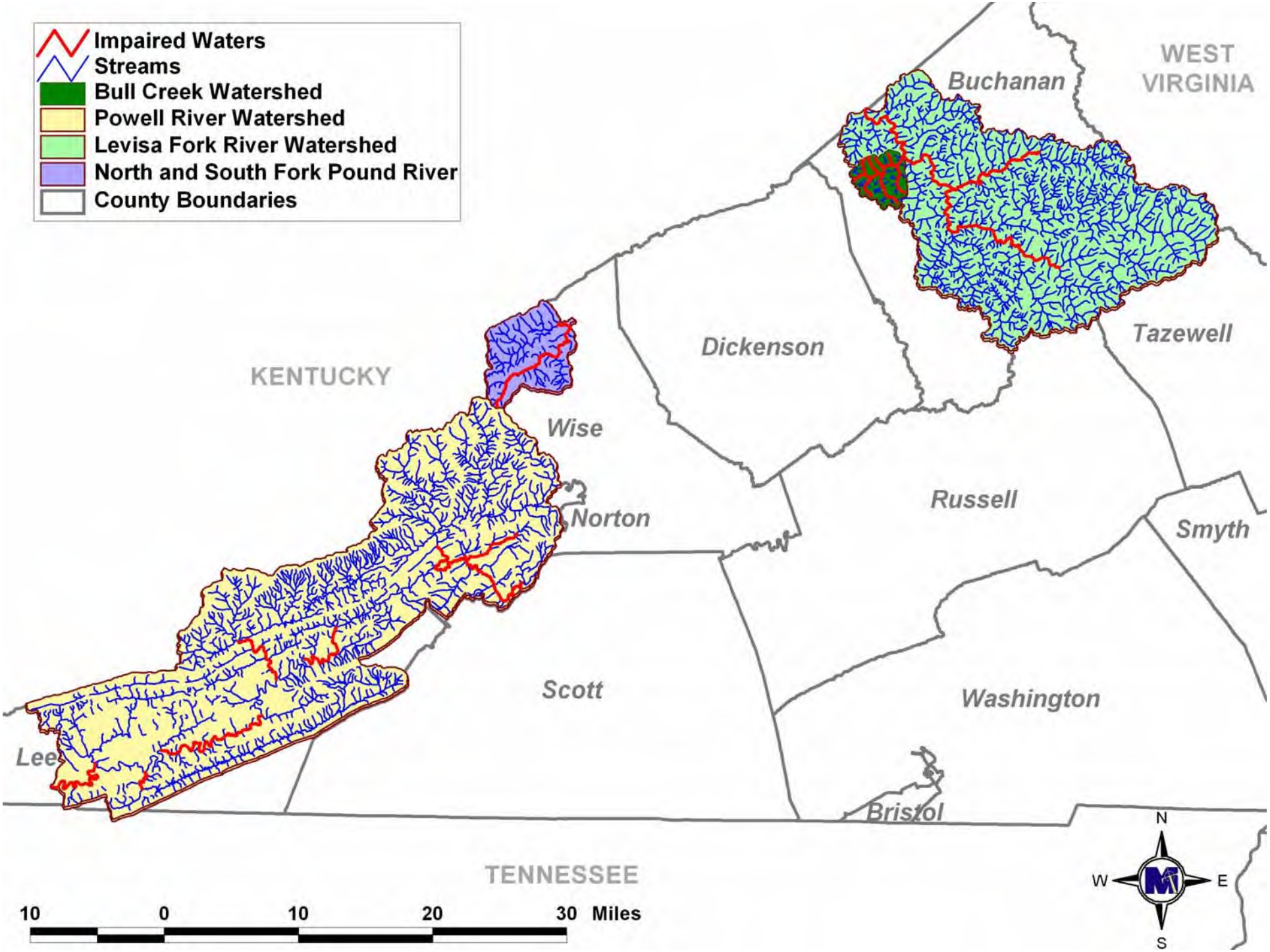
Phased TMDLs in Bull Creek, Levisa Fork, Pound River and Powell River

Public Meeting
April 25, 2013

Phased TMDLs

- Bull Creek
  - Sediment (TSS) and Total Dissolved Solids (TDS)
- Levisa Fork
  - TSS and PCBs
- Powell River
  - TSS
- Pound River
  - Lower North Fork Pound
    - TSS
  - South Fork Pound
    - TSS and TDS
  - Phillips Creek
    - TSS and TDS


Impaired Waters
Streams
Bull Creek Watershed
Powell River Watershed
Levisa Fork River Watershed
North and South Fork Pound River
County Boundaries
WEST VIRGINIA
Buchanan
Tazewell
Dickenson
KENTUCKY
Wise
Norton
Russell
Smyth
Scott
Washington
Lee
Bristol
TENNESSEE
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Why are we here tonight?

- Phased TMDLs
  - Concern over the data available and the modeling results during TMDL development.
- Process
  - "Phase I" TMDLs submitted
  - Additional monitoring
  - Develop "Phase II" TMDL

Issues of Concern

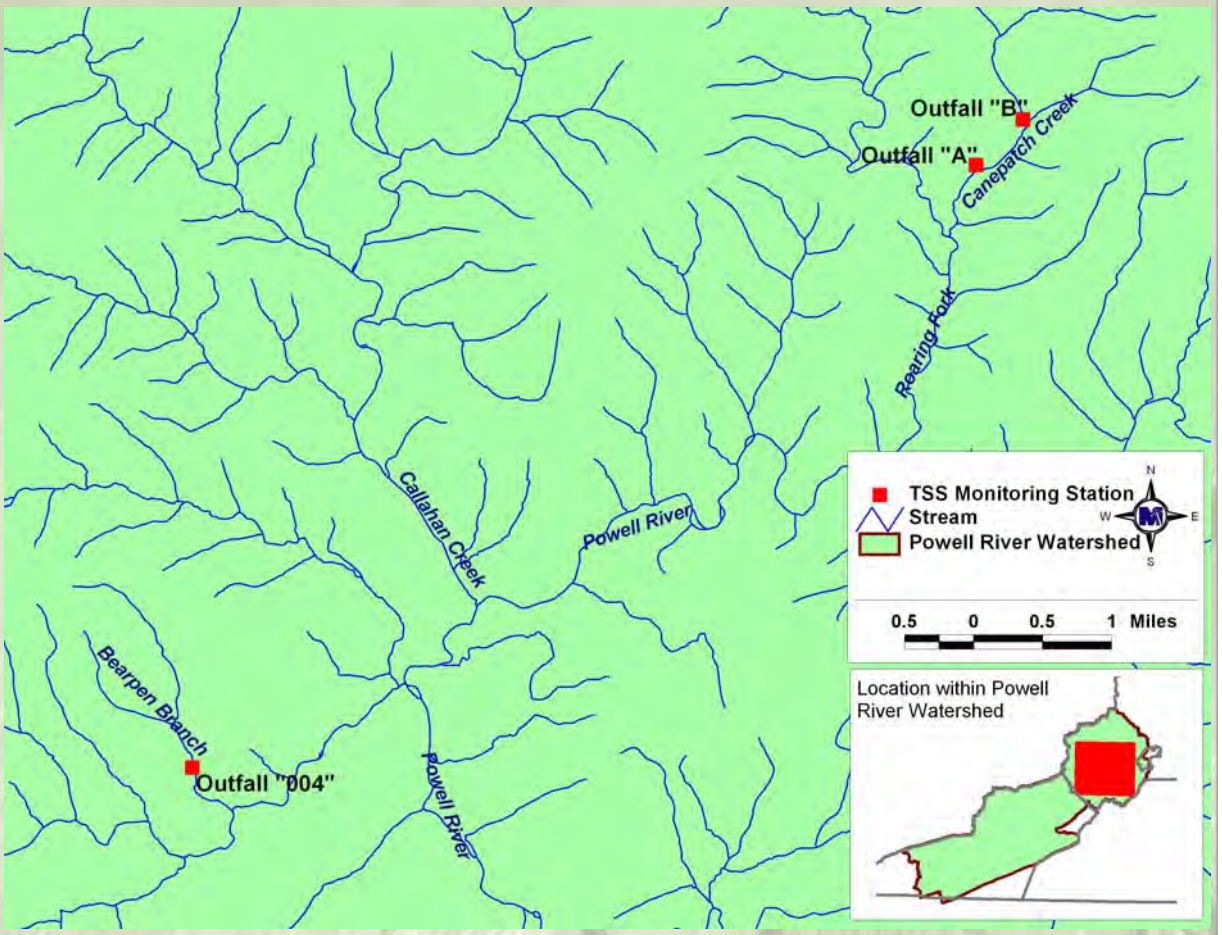
- What sediment loads are discharged from surface mine ponds during storm events?
- What is the annual contribution of TDS from the abandoned underground mine workings?
- How much do the existing straight pipes contribute to the stream's impaired aquatic life?
- Should PAH (naphthalene, 2-methyl naphthalene) be considered as a probable stressor?

Sediment form Surface Mine Ponds
(All 4 TMDLs)

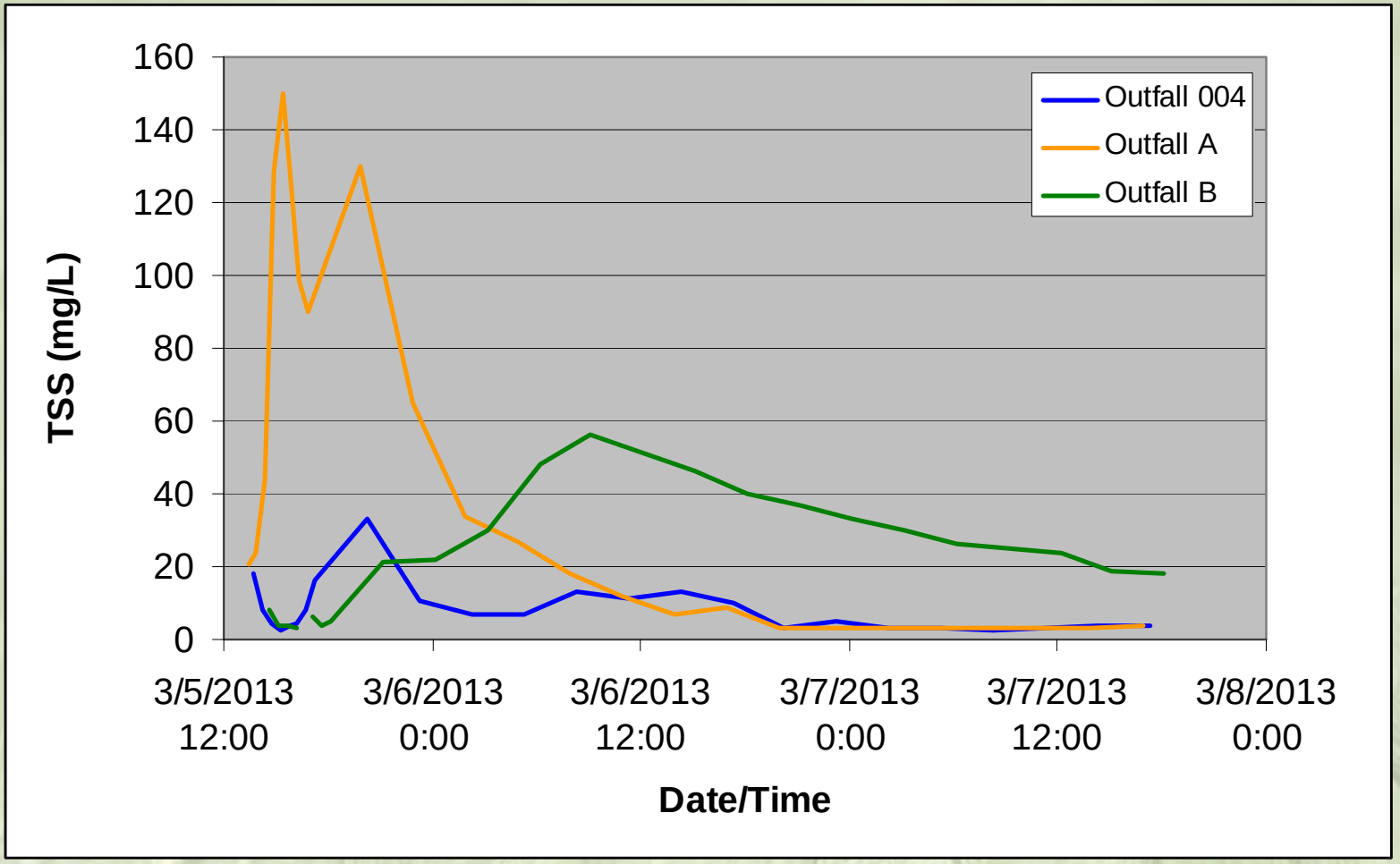
- Automated samplers at pond outlets
  - Rain gages
  - Stage (water level) measurement
- Sampling triggered by rainfall/stage
- Flow weighted composite samples
- Continue grab samples

TSS Sampling

- Three sites available for monitoring.
- Automated samplers in place.
- Automated flow monitoring being installed.



TSS Concentrations



~ 2 in. of rain

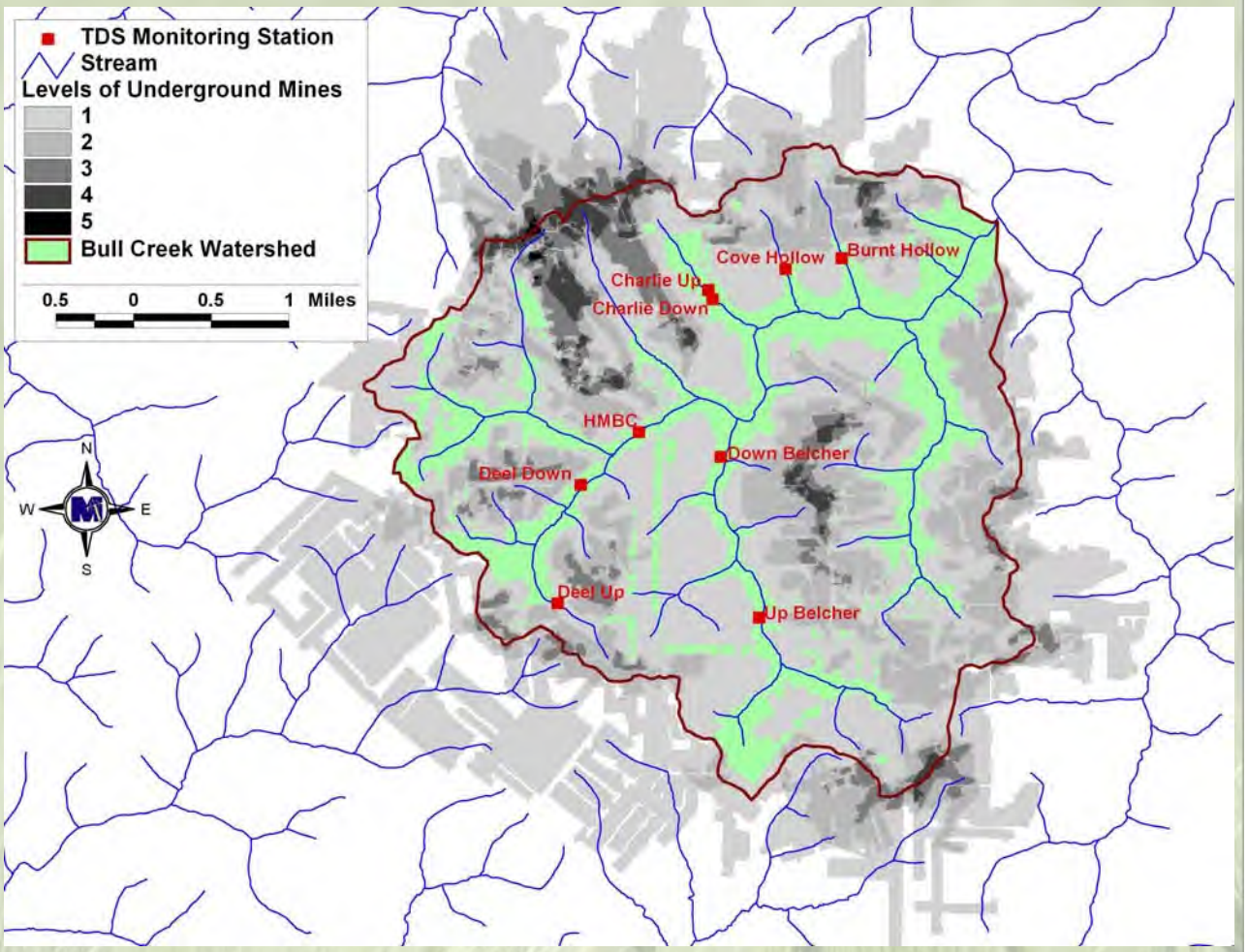
TDS from Mine Workings

(Bull and South Fork Pound)

- Within Bull Creek, well-defined discharges from abandoned underground mine workings.
- Flow from these discharges is considered to be relatively stable.
- Potential for the data to be extrapolated for use in other watersheds (e.g., South Fork Pound).
  - Relate loads of TDS to the expanse (e.g., area or volume) of the mine workings

TDS Monitoring

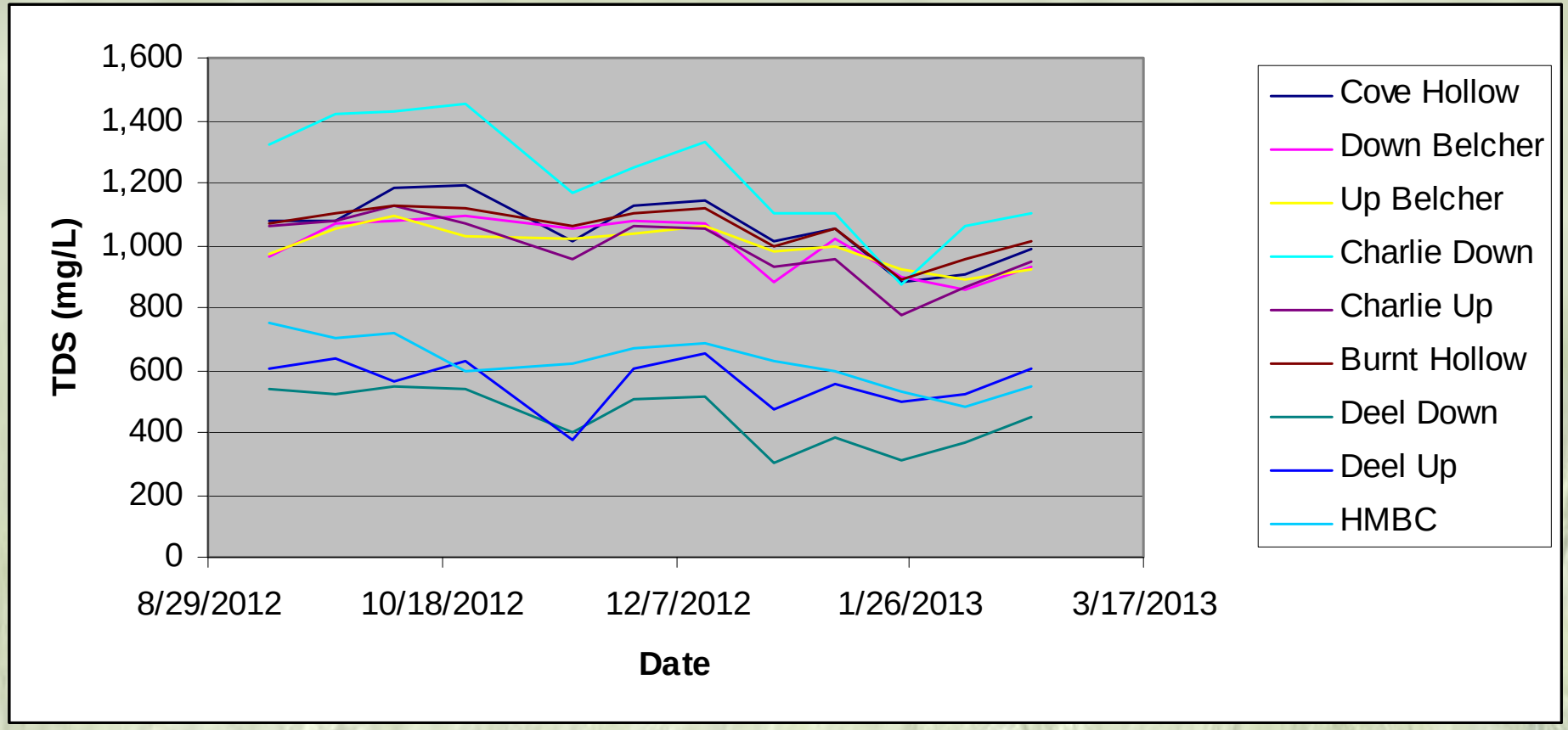
- Nine locations were identified.
- Flow and TDS measured on a fixed frequency (semi-monthly).



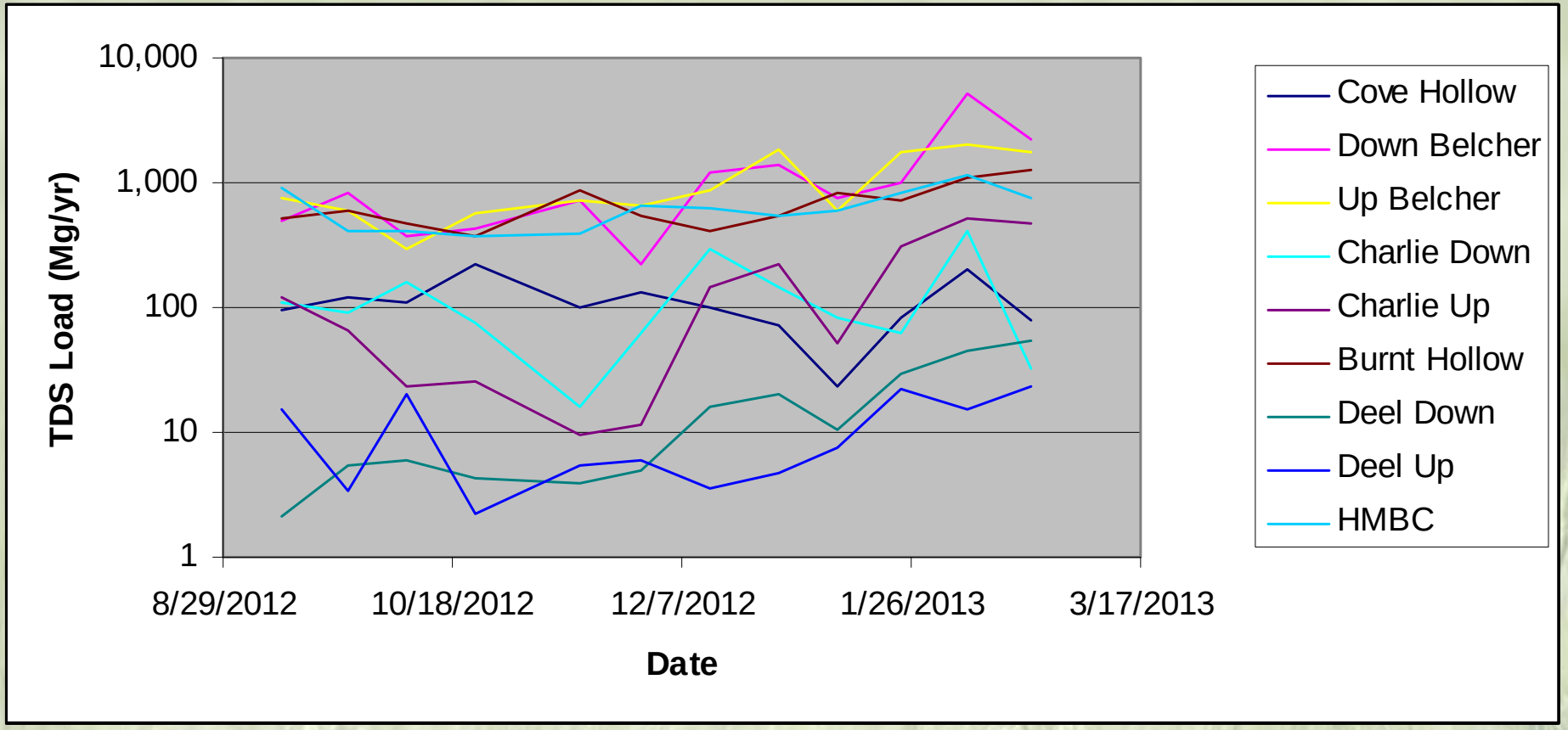
Precipitation during TDS Monitoring

Month	Average (in)	Observed (in)
September	3.14	6.47
October	2.82	4.11
November	2.91	0.71
December	3.27	2.74
January	3.19	5.92
February	3.09	1.26
Total:	18.42	21.21

TDS Concentrations



TDS Loads



Total Average Load = ~ 4,000 Mg/yr

Straight Pipes
(Bull Creek)

- Since straight pipes contribute TSS and TDS to the stream, they are already addressed by the TMDL.
- VDH study at Stonega was reviewed to determine if their was indication of specific pollutants associated with straight pipes that
  - are detrimental to aquatic life, and
  - exist at high enough levels to warrant reconsideration of the stressor identification.
- No pollutants were identified at levels that would override the earlier determination of TDS and TSS as most probable stressors to aquatic life.

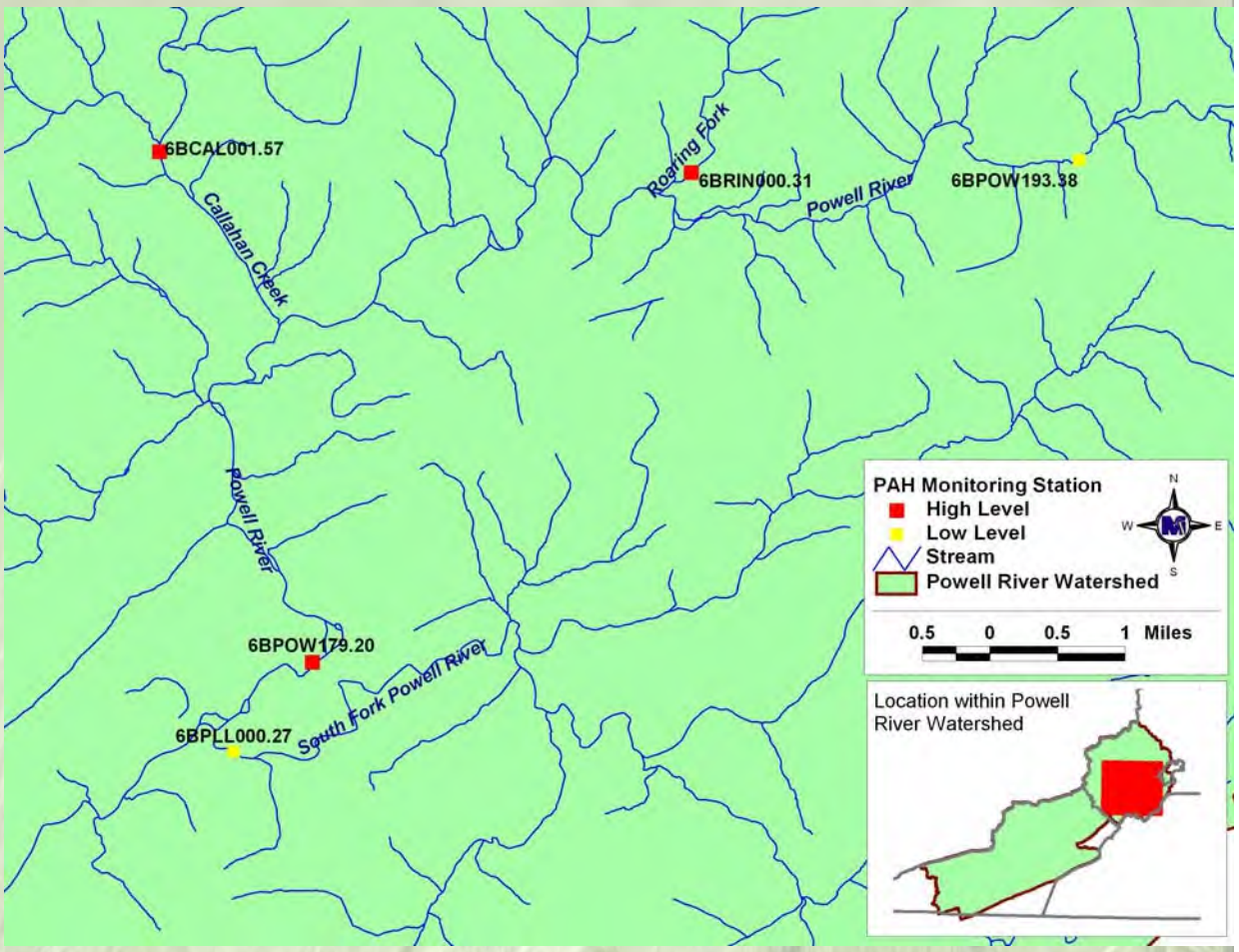
PAHs as Probable Stressor

(Powell River)

- High PAH levels in sediment samples were identified as a possible stressor.
- The PAHs found were forms of naphthalene, a highly volatile substance:
  - Burning of wood & fossil fuels
  - Tar camphor
  - Mothballs & moth flakes
  - Coal & petroleum
- Naphthalene is usually gone from rivers or lakes within two weeks.
- It binds very weakly to soil and sediments.
- Two possibilities identified.
  - An active, widely distributed source of naphthalene.
  - Naphthalene is bound-up in coal sediments that are not bio-available.

Bioavailability Testing

- Five Locations Identified
  - 3 with Naphthalene above Potential Effects Concentration (PEC) in Sediment
  - 2 below PEC
- Benthic Macroinvertebrate Tissues Analyzed for PAHs
  - Biota Collected from Stream
  - Mussels Placed in Stream Bottom for 2 Months



PAH Bioavailability

- Naphthalene and 2-Methyl Naphthalene were not detected in any of the biomass samples.

Station	Water Body	Napthalene and/or 2-Methyl Napthalene above PEC in Sediment	Fluoranthene	Pyrene	Phenanthrene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene
6BCAL001.57	Callahan Creek	Yes	X	X	X	X	X
6BRIN000.31	Roaring Fork	Yes					
6BPOW193.38	Powell River	No				X	
6BPOW179.20	Powell River	Yes					X
6BPLL000.27	South Fork Powell River	No				X	X

Recommendations

- Sediment
  - Monitoring is ongoing. No decisions made to date.
- TDS
  - Bull Creek should be re-modeled.
  - Data should be extrapolated to South Fork Pound, which may need to be remodeled.
- Straight Pipes
  - No change should be made to the aquatic life stressor identifications based on this analysis.
- PAH (Naphthalene)
  - PAH (Naphthalene) should remain a “possible” stressor, with no additional TMDL developed.

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